

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 09/662,849 Confirmation No. : 2146  
First Named Inventor : Martin SCHUESSLER  
Filed : September 15, 2000  
TC/A.U. : 1797  
Examiner : N. Bhat  
Docket No. : 102063.49153  
Customer No. : 23911  
Title : System for Heating and/or Converting at Least One Medium

**REPLY AFTER FINAL**

**Mail Stop AF**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the final Office Action dated February 21, 2008, reconsideration and allowance of the above-identified application are respectfully requested. Claims 1-4, 6 and 8-18 remain pending.

Initially, Applicant notes with appreciation the Examiner's approval of the drawings submitted on November 29, 2007. Applicant also appreciates the Examiner's withdrawal of the rejection based on the combination of Gonjo, Schussler and Koga.

Claims 1-4, 6 and 8-18 are rejected under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 6,447,736 to Autenrieth et al. ("Autenrieth"). This ground of rejection is respectfully traversed.

Autenrieth does not render Applicant's claims obvious because Autenrieth does not disclose or suggest all of the elements recited in these claims. For

example, there is no express or inherent disclosure in Autenrieth of the following claim elements:

1. insulating plates provided between the upper and lower end plates and the adjacent layers (claims 1 and 13);
2. an insulation layer formed separately from the stack and laterally surrounding the stack (claims 13 and 17);
3. end plates made of aluminum (claim 8);
4. devices for clamping the layers between the two end plates (claims 9 and 13); and
5. the devices for the clamping are formed by tie rods (claim 10).

Thus, with respect to claim 13, there is no express or inherent disclosure of three (3) claim elements (elements 1, 2 and 4 identified above). Instead of providing a prior art disclosure of the five (5) claim elements that find no express or inherent disclosure in Autenrieth, the Office Action concludes that these missing elements are obvious. Applicant respectfully submits that Autenrieth does not suggest these claim elements and the Office Action has not provided sufficient evidence that these claim elements are obvious in view of the disclosure of Autenrieth.

Autenrieth discloses a system for water vapor reforming of a hydrocarbon that includes a modular reactor unit composed of stacked plates. In the second embodiment of Autenrieth (illustrated in Figure 2 reproduced below) insulating plates are arranged *between different functional modules*. Specifically,

insulating plate 24 is arranged between evaporator/burner module 9 and oxidation stage/prereforming module 12; insulating plate 25 is arranged between oxidation stage/prereforming module 12 and stage/prereforming module 16; and insulating plate 26 is arranged between stage/prereforming module 16 and reformer/burner module 19.

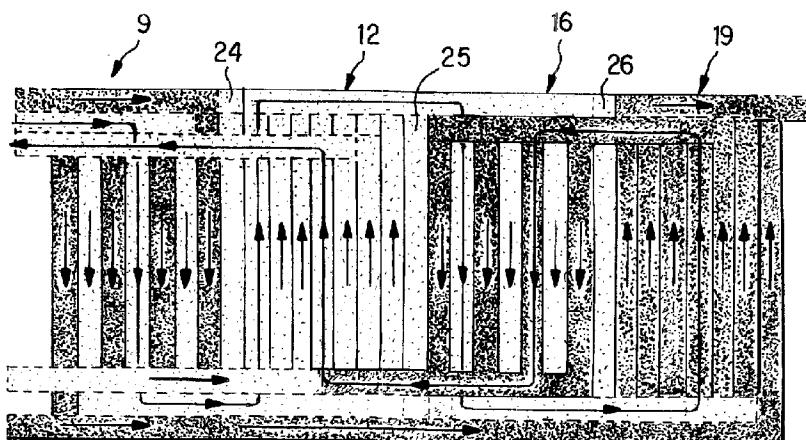


Fig. 2

Significantly, there are no “end plates” in the system of Autenrieth. Instead, the modular reactor of Autenrieth is bounded by modules, namely evaporator/burner module 9 and reformer/burner module 19. Thus, Autenrieth only discloses the use of insulating plates *between* modules, whereas Applicant’s claims recite that “insulating plates are provided *between* the end plates and layers which are respectively adjacent to the end plates.”<sup>1</sup>

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<sup>1</sup> Claim 1 (emphasis added). Independent claim 13 recites similar elements.

The Response to Arguments section of the final Office Action reasons that because Autenrieth discloses placing *insulating plates between functional areas*, it would have been obvious to place insulating plates *between end plates and adjacent layers*. However, in view of Autenrieth's absence of a disclosure or suggestion of end plates, it would not have been obvious for one of ordinary skill in the art to move the insulating layers that are disclosed between functional areas to outside of a functional area. In other words, the insulating plates are disclosed by Autenrieth as insulating functional areas from each other, and there is nothing in Autenrieth disclosing or suggesting insulating the functional areas from an outside environment, such as by the use of insulating plates being arranged between the layers and the end plates as recited in Applicant's claims.

The Response to Arguments section of the final Office Action also states that there has been now showing of criticality of the arrangement of the insulating plates between the layers and the end plates. Applicant, however, has recognized that placing insulators between end plates and adjacent layers ensures "that the end plates can be thermally uncoupled from the plates forming the media spaces, so that a desired operating temperature can be reached more rapidly in the media spaces."<sup>2</sup> Thus, Applicant's disclosure contains such a showing of criticality, and without any additional evidence of a reason to move the insulating layer between the functional areas and the non-disclosed end

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<sup>2</sup> Application as filed at page 4, lines 17-21.

plates of Autenrieth, Autenrieth does not render the claimed insulating plates obvious.

Moreover, Autenrieth teaches away from the addition of end plates and insulating plates between the end plates and the adjacent layers. Specifically, Autenrieth discloses that the “compact construction of the modular reactor unit requires only little space and, because of the small surface, has comparatively low heat losses.”<sup>3</sup> The rejection of Applicant’s claims requires that the size of the modular reactor unit be *increased* by *adding* (1) end plates and (2) insulating plates between the end plates and the adjacent layers. Clearly, *increasing the size* of the modular reactor unit is completely the opposite of the object of Autenrieth to provide a compact unit. Thus, one of ordinary skill in the art would not have found it obvious to increase the size of the unit to *add* (1) end plates and (2) insulating plates between the end plates and adjacent layers to achieve the system of Applicant’s claims.

Autenrieth also teaches away from a modification of the second claim element identified above. Specifically, “an insulation layer insulating said stack from a surrounding environment, said insulation layer being formed separately from said stack and laterally surrounding the stack” would *increase the size of the modular reactor unit* of Autenrieth, thus going against the stated objective of Autenrieth. Accordingly, in view of Autenrieth’s disclosure of the advantages of

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the compact size of the disclosed unit that does not include an insulating layer laterally surrounding the stack, one of ordinary skill in the art would not have found it obvious to increase the size of the unit to include such an insulating layer.

Regarding the third claim element missing from Autenrieth, the end plates being made of aluminum, the Office Action concludes that a skilled artisan would be able to select this particular material. Without a disclosure or suggestion of end plates, Autenrieth cannot disclose or suggest that these non-disclosed end plates are made of aluminum. Furthermore, Applicant's have recognized a number of advantages of aluminum for end plates. Specifically, such end plates have a low weight and "a good mechanical stability as long as they have a significantly lower temperature than those in the hydrogen-releasing zone."<sup>4</sup> This significantly lower temperature is achieved in the present invention using the insulating plates between the end plates and the adjacent layers. Because Autenrieth does not disclose or suggest such insulating plates, the skilled artisan would not have found it obvious to use aluminum end plates because of the mechanical stability problems due to the lack of insulation between the end plates and the functional units.

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<sup>3</sup> Column 5, lines 35-37.

<sup>4</sup> Application as filed at page 5, lines 1-4.

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Regarding the fourth and fifth claim elements identified above, the Office Action concludes that these claim elements are obvious design choices absent a showing of criticality. First, the Office Action has not provided any prior art evidence of such arrangements. Moreover, the Office Action has not provided sufficient reasoning to support why one of ordinary skill in the art would have included devices for clamping the layers, much less such devices being formed by tie rods.

Because Autenrieth does not disclose or suggest at least three (3) elements recited in Applicant's claim 13, and the Office Action has not provided any prior art or other evidence to remedy this deficiency of Autenrieth, the obviousness rejection of this claim should be withdrawn. Furthermore, because Autenrieth does not disclose or suggest the elements of claims 1, 8, 9 and 17, the obviousness rejection of these claims should be withdrawn. Claims 2-4, 10-12, 14-16 and 18 are patentably distinguishable over the current ground of rejection at least by virtue of their dependency from independent claims 1 and 13.

For at least those reasons stated above, it is respectfully requested that the rejection of claims 1-4, 6 and 8-18 as being obvious in view of Autenrieth be withdrawn.

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If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 102063.49153).

Respectfully submitted,

May 9, 2008

  
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